# James River - Richmond TMDL Development: Changes Since Previous Draft

## Public Meeting

## June 30, 2010

Virginia Department of Environmental Quality

# Purpose of this meeting

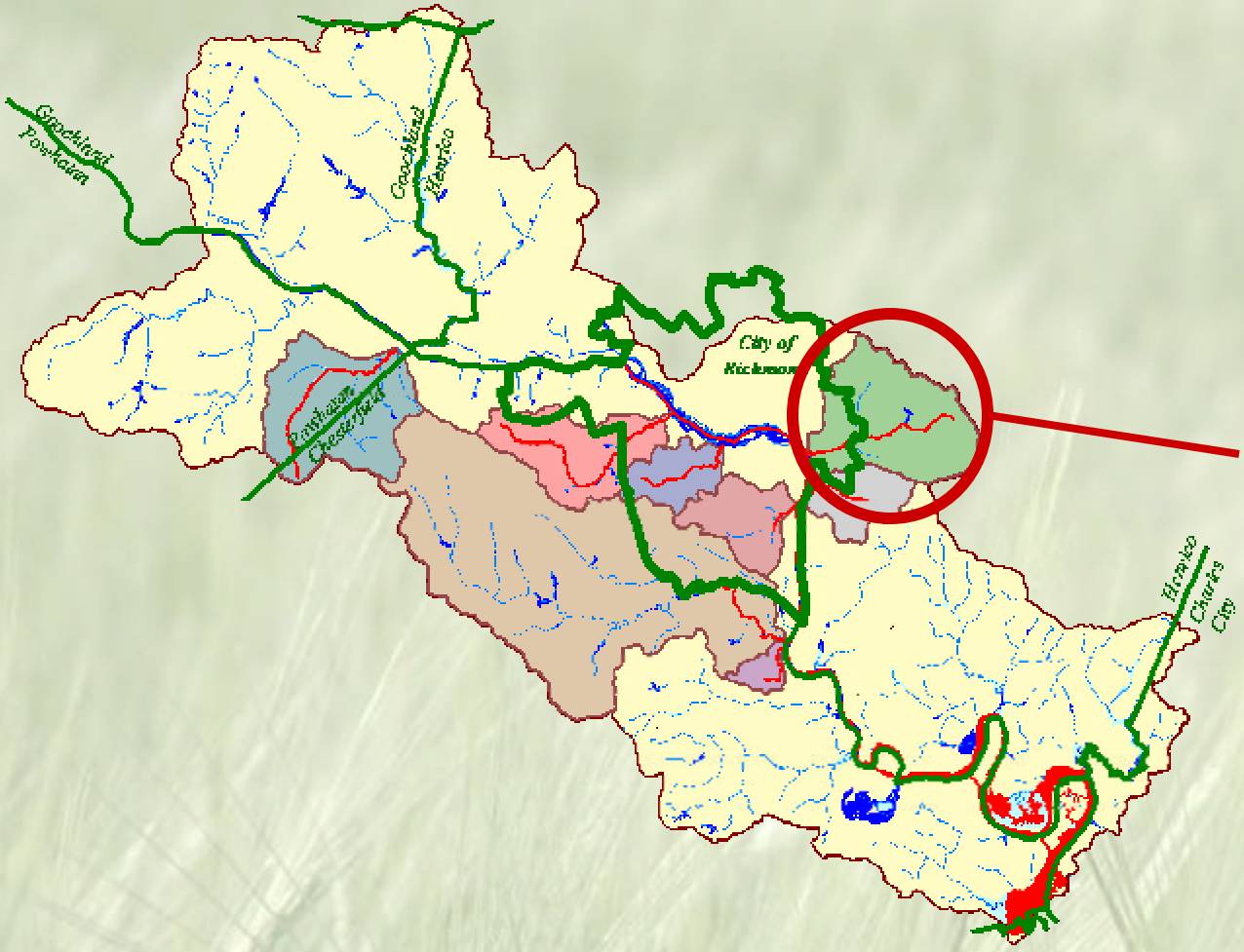
To discuss changes to the TMDL technical document since v 77

*(available on 11/23/2009)*

# Endpoints

- ***E. coli* bacteria**
  - **Two standards**
    - 126 cfu/100 ml geometric mean
      - Used in modeling to determine TMDL
      - Can be used in monitoring (when 4 or more samples collected per month)
    - 235 cfu/100 ml instantaneous sample
      - Used in monitoring to list and de-list (when <4 samples collected per month)

# Impairment Locations



# Gillies Creek: Additional Scenarios, 10 & 11

| Scenario | Straight Pipes | Residential / Urban | City of Richmond CSO Program Project Plan | *E. coli* Standard percent violations: |
|---|---|---|---|---|
| | *Reductions Applied* | | | *%>126 GM* |
| 1 (Existing) | 0 % | 0 % | Existing | 95 |
| 7 | 100 % | 94 % | Alternative E plus 95% further reductions | 0 |
| 9a/9b | 100 % | 96/97 % | Alternative E / Alternative E and a 73% reduction | 0/ 0%>630GM |
| 10 | 0 % | 0 % | Alternative E plus 5MG storage | 65 |
| 11 | 100 % | 94 % | Alternative E plus 5MG storage | 3.33 |

# Gillies Creek: Additional Verbiage

- City of Richmond's Preliminary Estimates
  - Scenario 7: Final TMDL
    - Need 29.2MG of storage
    - Cost $300 million dollars
  - Scenario 9a/9b: Upstream/downstream Split Standard
    - Need 22.4MG of storage
    - Cost $230 million dollars
  - Scenario 10 & 11
    - Need 5MG of storage

# Gillies Creek: Additional Verbiage (cont.)

- Path Forward
  - Complete TMDL
  - Prepare Implementation Plan (IP)
    - Evaluate impact of Gillies Creek on James River
      - TMDL Modeling Results – Suggests no further reductions beyond the COR's LTCP Alternative E required in Gillies for JR to meet standard
        - At model subwatershed outlet; ~1 mile downstream
      - Preliminary Modeling Results – Suggests the potential bacterial plume from Gillies not negatively impacting JR at Rocket's Landing
      - DEQ on-going Monitoring for support
    - Warning System (Real-Time Alert)

# Gillies Creek Entering James River

*Upstream view*

*Downstream view*

# Gillies Creek: Additional Verbiage (cont.)

- Path Forward
  - Potential UAA on Gillies Creek
    - UAA = Use Attainability Analysis
    - UAA May be appropriate
      - Lower 1.7 miles is a concrete channel
      - Limited access and low appeal for recreational uses
      - IP
        - Document further modeling and monitoring work on Gillies Creek and James River (downstream uses may not be impacted by a UAA)
        - Robust warning system during overflow periods

# Delisted James River Segments Verbiage Added

- TMDL Implementation and Reasonable Assurance Chapter 6
  - IP
    - Document further study of upstream impacts on current James River impaired segment
    - Document potential cost-effective and efficient BMPs to address bacterial reductions

# EPA's CSO Control Policy Verbiage Added

- TMDL Implementation and Reasonable Assurance Chapter
  - Added Section 6.3.4
    - Indicates requirement of CSO communities to develop and implement LTCPs in compliance with the Clean Water Act
    - CSO communities may use "demonstration" approach
      - Data/modeling to show LTCP will provide for compliance with applicable requirements
      - The WLAs were developed based on the LTCP performance standards
      - If water quality standards are not attained after completion of a CSO LTCP as determined by post-construction monitoring, the EPA CSO Policy requires CSO communities to take additional steps

- 30-day Public Comment period beginning July 1
  - **Ends 8/2/2010**
  - **Submit comments to Margaret Smigo**
- Submit to State Water Control Board
- Submit TMDL to EPA
- Implementation Plan Development / UAA on lower Gillies Creek
- Implementation

# James River – City of Richmond TMDL Contacts

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*Send Written Comments by 8/2/2010*

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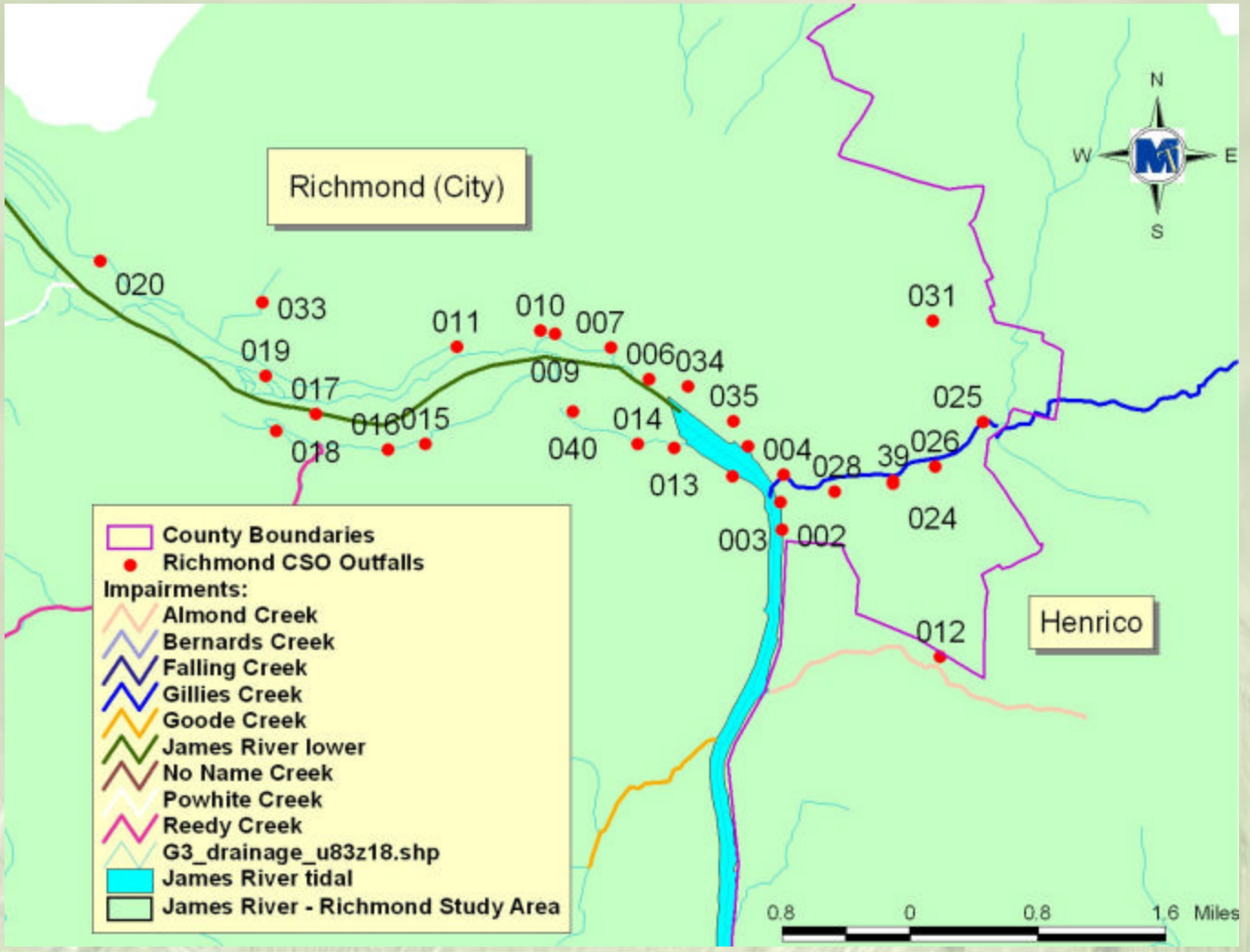
# Extra Information Slides ->

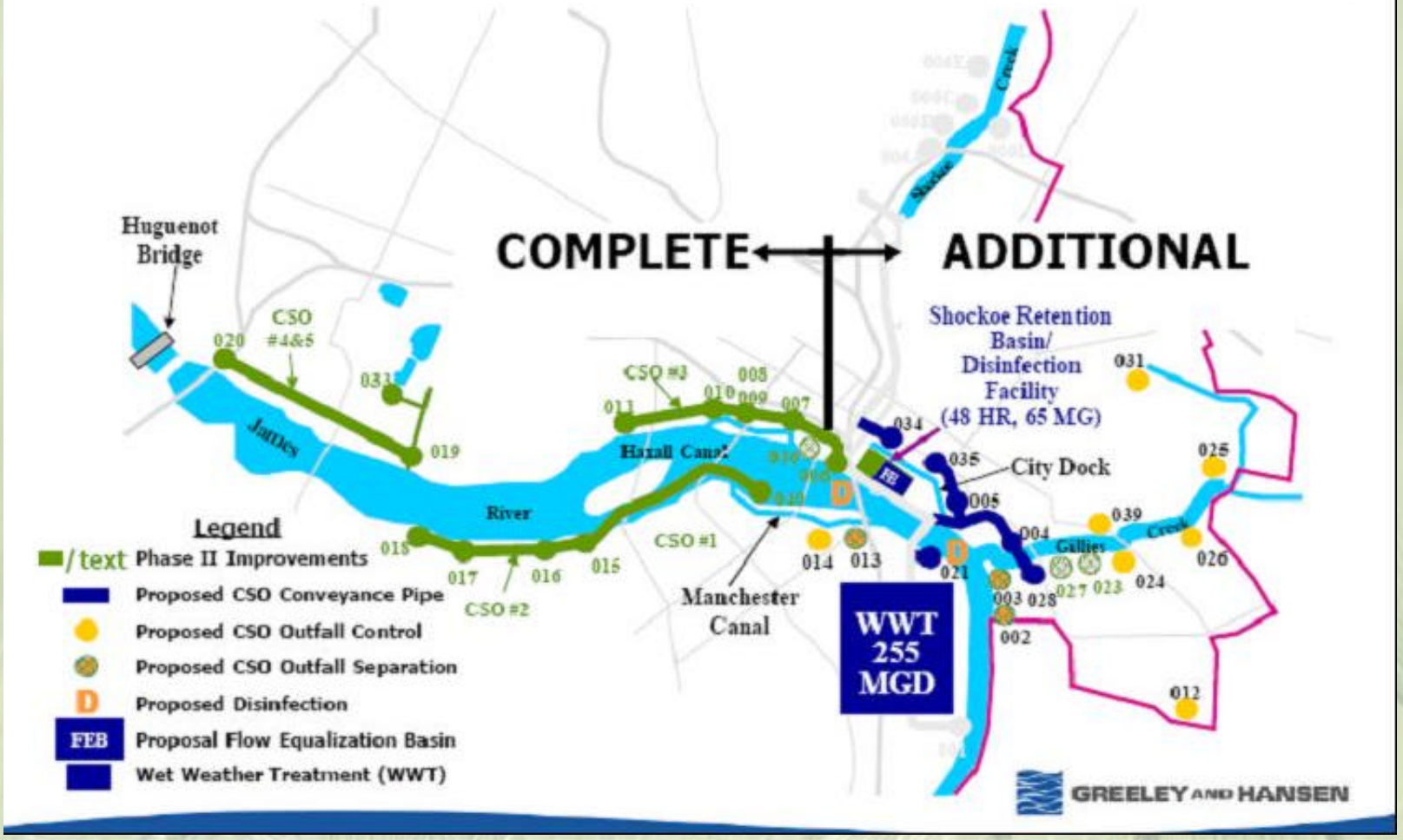
# CSO Outfall Locations



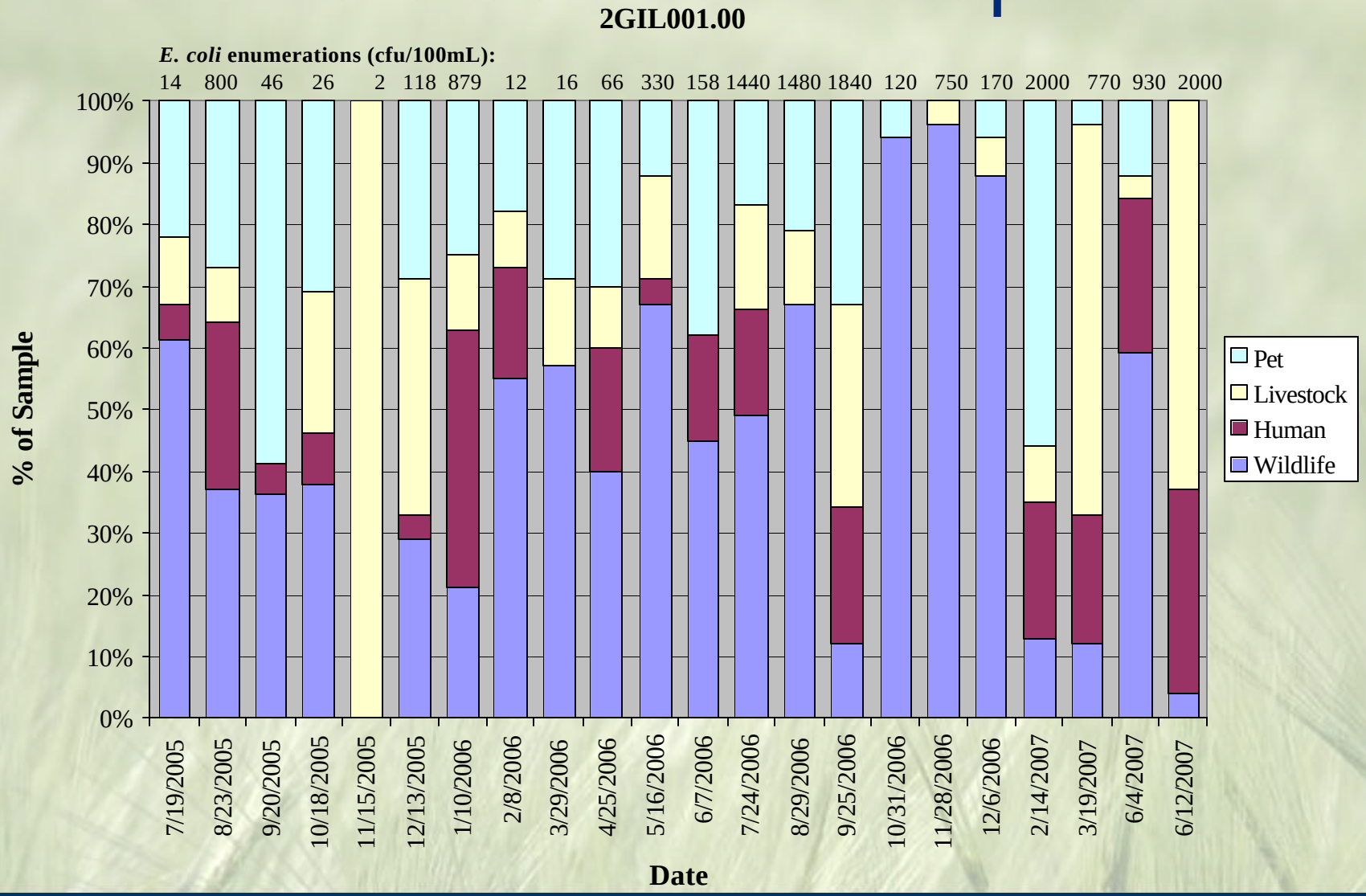
# Modeling Details

- 3 Models were used
  - SWMM
    - City of Richmond CSO Program
    - Simulate urban storm runoff and sewage from areas draining to a CSO
  - HSPF
    - Simulate runoff, interflow, groundwater, stream flow
    - Modeled entire study area watershed
    - Used SWMM output from urban area as input to HSPF
  - CEQUALW2
    - Simulate in-stream process for tidal segment
    - Used SWMM and HSPF output as input to CEQUALW2

# Section 3: Existing System Description
## CSO Long-Term Control Plan: Alternative E



# Gillies Creek BST Recap

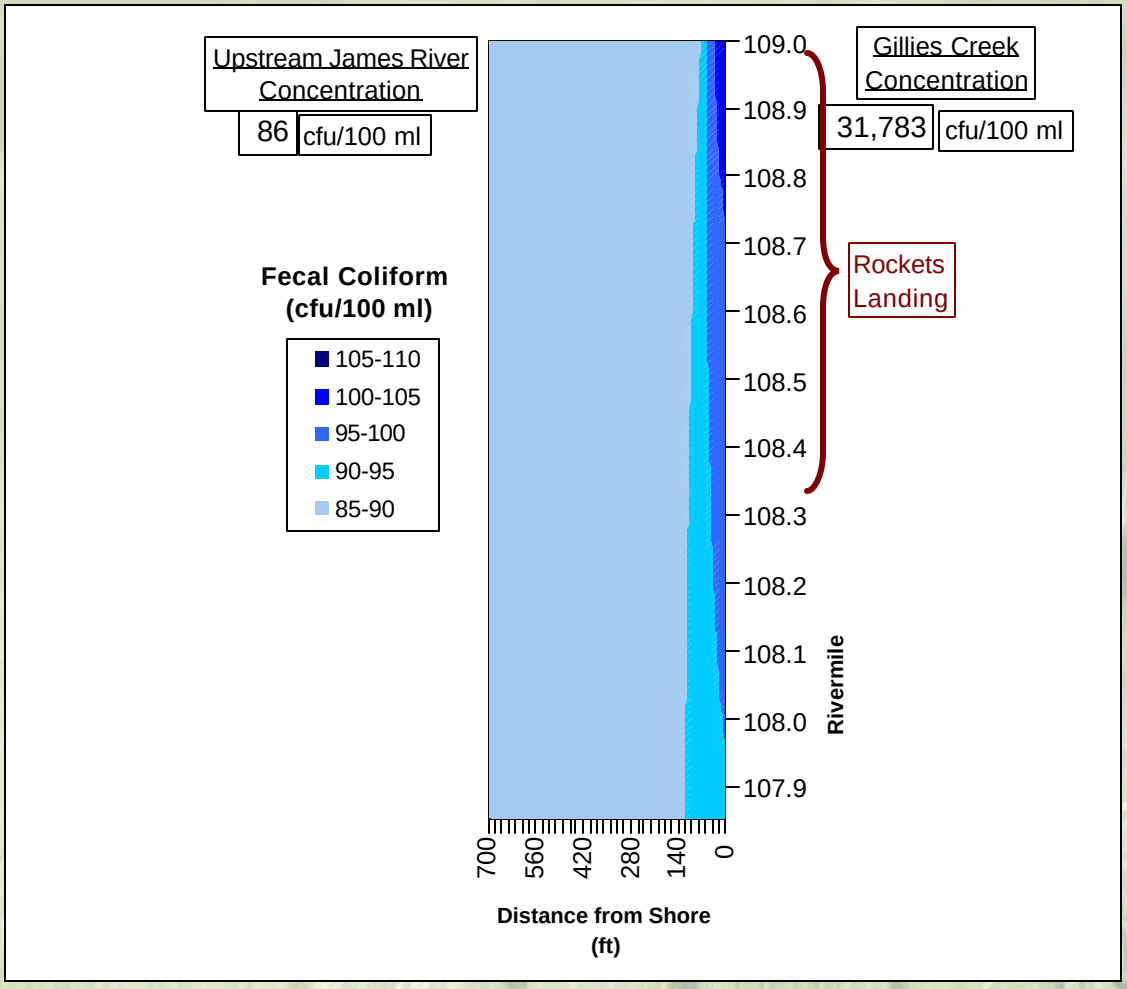


# All Stations BST Recap

| | | Weighted Averages: | | | | |
|---|---|---|---|---|---|---|
| Stream Name | Station | Wildlife | Human | Livestock | Pet | Anthropogenic (H+L+P) |
| Almond Creek | 2-ALM000.42 | 65% | 13% | 9% | 13% | 35% |
| Bernards Creek | 2-BOR001.73 | 44% | 4% | 32% | 20% | 56% |
| Falling Creek | 2-FAC000.85 | 52% | 13% | 12% | 23% | 48% |
| Gillies Creek | 2-GIL001.00 | 34% | 20% | 24% | 22% | 66% |
| Goode Creek | 2-GOD000.77 | 69% | 9% | 7% | 15% | 31% |
| James River | 2-JMS099.30 | 27% | 20% | 31% | 22% | 73% |
| James River | 2-JMS104.16 | 31% | 31% | 22% | 16% | 69% |
| James River | 2-JMS111.17 | 56% | 14% | 21% | 9% | 44% |
| James River | 2-JMS111.47 | 52% | 12% | 22% | 14% | 48% |
| James River | 2-JMS112.33 | 55% | 5% | 27% | 13% | 45% |
| James River | 2-JMS112.79 | 53% | 7% | 26% | 14% | 47% |
| James River | 2-JMS115.29 | 26% | 16% | 43% | 13% | 72% |
| James River | 2-JMS117.35 | 73% | 9% | 10% | 8% | 27% |
| No Name Creek | 2-XSZ001.58 | 60% | 10% | 5% | 25% | 40% |
| Powhite Creek | 2-PWT00.57 | 69% | 12% | 5% | 14% | 31% |
| Reedy Creek | 2-RDD000.19 | 57% | 9% | 10% | 24% | 43% |

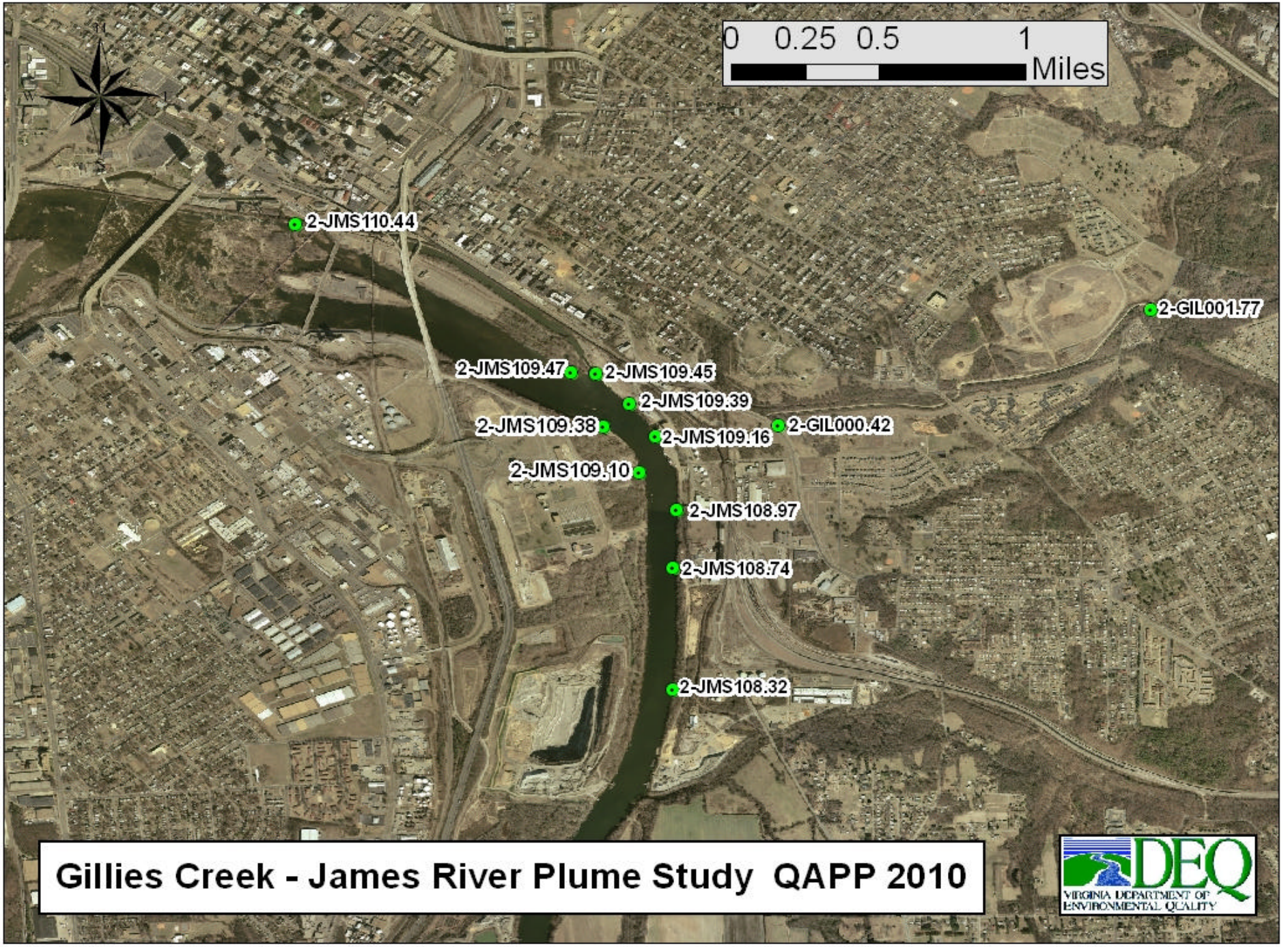
# Preliminary Gillies Bacterial Plume Model

- Spatial distribution of the James River FC concentration relative to Rocket's Landing
  - Worst Case Scenario
  - Incoming Gillies FC = 31,783 cfu/100mL
  - Incoming JR FC = 86 cfu/100mL
  - Results: JR FC = 107 cfu/100mL



# Gillies Creek and JR Plume Study - Stations

| Station | Stream | Description | Latitude | Longitude |
|---|---|---|---|---|
| 2-JMS110.44 | James River | North bank, below Pipeline Rapid | 37 31 57 | -77 26 07 |
| 2-JMS109.47 | James River | East bank, at point below Great Shiplock Park | 37 31 30 | -77 25 18 |
| 2-JMS109.45 | James River | East bank, 40m below CSO 005, from dock | 37 31 29.8 | -77 25 13.6 |
| 2-JMS109.39 | James River | East bank, at fishing access upstream of Lone Star Cement | 37 31 24.2 | -77 25 07.6 |
| 2-JMS109.16 | James River | East bank, 100m downstream of Gillies Creek at NW corner of concrete slab | 37 31 18.2 | -77 25 03.1 |
| 2-JMS108.97 | James River | East bank, 20m upstream of CSO 002 at dock | 37 31 04.7 | -77 24 59.4 |
| 2-JMS108.74 | James River | At Rocketts Landing, downstream side dock | 37 30 54.2 | -77 25 00 |
| 2-JMS108.32 | James River | Above IMTT loading dock | 37 30 32 | -77 24 59.9 |
| 2-JMS110.34 | James River | South Bank Last Rapid | 37 31 38 | -77 26 19 |
| 2-JMS109.90 | James River | Under I-95 South Bank | 37 31 34.9 | -77 25 43.5 |
| 2-JMS109.38 | James River | West bank, USS Ancarrows | 37 31 20 | -77 25 12.2 |
| 2-JMS109.10 | James River | West bank, DSS Ancarrows | 37 31 11.6 | -77 25 05.8 |
| 2-JMS110.90 | James River | Manchester Br. near South Bank | 37 31 50 | -77 26 39 |
| 2-MAN000.19 | Manchester Canal | Below Stockton Street CSO 014 | 37 31 37 | -77 25 50.5 |
| 2-GIL000.42 | Gillies Creek | At Williamsburg Road | 37 31 20.1 | -77 24 41.2 |
| 2-GIL001.77 | Gillies Creek | At Jennie Scher Road | 37 31 41 | -77 23 35 |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2-JMS108.74
2-JMS108.32
Gillies Creek - James River Plume Study QAPP 2010
DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY